Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/810
SWEDEN
February 1964
Original: ENGLISH

Confidential until official release during Conference

Abstract

Design and Manufacture of the Reactor Pressure Vessels for the Ågesta and Marviken Power Stations and some Future Developments

O. Hellström [1)]

The Swedish nuclear power program has from the beginning been concentrated upon heavy water and natural uranium reactors. After some studies it was decided to make the Ågesta reactor of the pressure vessel design type. From a general point of view the Ågesta reactor might be regarded as a prototype for two attractive outlines of pressure vessel unit developments for competitive nuclear power, namely

1) the uniform lattice reactor (homogenized), PHWR
2) the natural circulation direct cycle boiling reactor equipped with facilities for nuclear superheating, BHWR.

The Marviken Power Station is of the second type and is designed for 140 Mw elect. for saturated steam operation and 200 Mw elect. with nuclear superheat operation. The pressure vessel for this plant is designed and the manufacture has started.

The paper describes the design and manufacture of the Ågesta and the Marviken reactor pressure vessels. Code requirements, types of material and properties and special design calculations of interesting parts are discussed. Further, the special manufacture problems are delt with which is due to the weight, geometric sizes and high tolerance requirements of these pressure vessels. The shop facilities must be sufficient to take care of these special characteristics. As for the increase in geometric size it can be postulated that with use of better materials and adjusted fabrication methods the size problems can be taken proper care of during the next 5 - 10 years. For plant sizes considerably above 500 - 600 Mw elect. it is likely that the pressure vessels must be prefabricated in the shop and site assembled by using special technique.

---

1) Uddeholms AB, Degerfors